CLAIMS

1. A process for disrupting filter cake in an underground formation, which process comprises:

(i) incorporating into a treatment fluid a solid polymer capable of being converted by hydrolysis into one or more organic acids;

(ii) introducing the treatment fluid into the underground formation; and

(iii) allowing the solid polymer to hydrolyse in the presence of water to produce organic acid such that acid soluble material within the filter cake or adjacent formation is dissolved.

2. A process according to claim 1 wherein the polymer is a polyester.

3. A process according to any one of the preceding claims wherein the polymer is an aliphatic polyester.

4. A process according to any one of claims 1, 2 and 3 wherein the polymer is polylactide, polyglycolide, lactide-glycolide copolymer, lactide-caprolactone copolymer, glycolide-caprolactone copolymer or lactide-glycolide-caprolactone copolymer.

5. A process according to claim 1 wherein the polymer is a polymer which incorporates lactide, glycolide or caprolactone.

6. A process according to claim 1 wherein the polymer is a polymer which incorporates lactide, glycolide or caprolactone with other monomers.

7. A process according to any one of the preceding claims wherein hydrolysis of the polymer produces one or more organic acids.

8. A process according to any one of the preceding claims wherein hydrolysis of the polymer produces lactic acid or glycolic acid.

9. A process according to any one of the preceding claims wherein the polymer is polylactic acid or polyglycolic acid.

10. A process according to any one of the preceding claims wherein one or more other materials, chemicals, catalysts or enzymes are incorporated into the polymer by encapsulation to allow their controlled release coincident with or after acid production.

11. A process according to claim 10 wherein the said one or more other materials, chemicals, catalysts or enzymes are incorporated into the polymer by dissolution or dispersion to allow their controlled release coincident with acid production.

12. A process according to claim 10 or 11wherein the said one or more other materials, chemicals, catalysts or enzymes released from the polymer have functional activity for filter cake treatment or as production chemicals.

13. A process according to any one of the preceding claims wherein the solid polymer is used in the form of a sphere, cylinder, cuboid, fibre, powder or bead, or other configuration.

14. A process according to any one of the preceding claims which further comprises incorporating a buffer into the treatment fluid.

15. A process according to any one of the preceding claims which further comprises incorporating into the treatment fluid one or more polymer breakers.

16. A process according to claim 15 wherein the polymer breaker is a hydrolase enzyme.

17. A process according to claim 15 or 16 wherein the polymer breaker is a polysaccharide hydrolysing enzyme.

18. A process according to any one of claims 15 to 17 wherein the polymer breaker is an enzyme which can hydrolyse starch, xanthan, cellulose, guar, scleroglucan or succinoglycan or a derivative of any one of these polymers.

19. A process according to claim 15 wherein the polymer breaker is an oxidant.

20. A process according to claim 19 wherein the polymer breaker is an oxidant selected from persulphate, hypochlorite, peroxide, perborate, percarbonate, perphosphate, persilicate, a metal cation and a hydrogen peroxide adduct.

21. A process according to any one of claims 15 to 20 wherein the polymer breaker is in the form of a delayed release preparation.

22. A process according to any of the preceding claims wherein the treatment fluid is a gravel packing fluid which comprises one or more solid polymers and optionally one or more polymer breakers.

23. A process according to any of the preceding claims wherein the treatment fluid disrupts or degrades at least a portion of the filter cake and increases the permeability of the formation.

24. A process according to any one of the preceding claims wherein at least a portion of the polymer remains in the underground formation and continuously releases organic acid and a production chemical during hydrocarbon production or water injection until the polymer has completely hydrolysed.

25. A process according to any one of the preceding claims wherein the underground formation contains hydrocarbon or water.

26. A process according to claim 25 wherein the underground formation contains hydrocarbon and wherein the process further comprises recovering a hydrocarbon from the treated formation.

27. A process according to claim 25 wherein the underground formation contains water and wherein the process further comprises recovering water from the treated formation.

28. A process according to any one of the preceding claims wherein the treatment fluid containing the solid polymer is introduced into the formation via a well bore which extends to the formation.

29. A process according to any one of the preceding claims wherein the treatment fluid further comprises an acid sensitive viscosifying agent and wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer.

30. A process according to claim 29 wherein the viscosifying agent is borate crosslinked guar gum.

31. A process according to any of the preceding claims wherein the treatment fluid further comprises calcium peroxide and wherein the organic acid produced by hydrolysis of the solid polymer leads to the generation of hydrogen peroxide.

32. A process according to any of the previous claims wherein the treatment fluid further comprises ammonium bifluoride and wherein the organic acid produced by hydrolysis of the solid polymer leads to the generation of hydrogen fluoride.

33. A process for preventing damage to screens and other underground equipment during placement in an underground formation which comprises coating of the equipment with a solid polymer capable of being converted by hydrolysis into one or more organic acids, wherein the solid polymer is polylactide, lactide-glycolide copolymer, lactide-caprolactone copolymer, glycolide-caprolactone copolymer or lactide-glycolide-caprolactone copolymer.

34. A process for preventing damage to screens and other underground equipment during placement in an underground formation which comprises incorporating into at least part of the internal spaces of the equipment a solid polymer that is capable of being converted by hydrolysis into one or more organic acids.

35. A process for preventing damage to screens and other underground equipment during placement in an underground formation which comprises using as a centraliser for the equipment a moulded form of a solid polymer which is capable of being converted by hydrolysis into one or more organic acids.

36. A screen or other underground equipment which is suitable for use in the production of oil, gas or water from wells drilled into underground formations and which comprises, coated thereon and/or incorporated into at least part of the internal spaces thereof, a solid polymer according to any of the preceding claims which is capable of being converted by hydrolysis into one or more acids.

37. A screen or other underground equipment according to claim 36 wherein the polymer is a polyester.

38. A screen or other underground equipment according to claim 36 or 37 wherein the polymer is polylactide, lactide-glycolide copolymer, lactide-caprolactone copolymer, glycolide-caprolactone copolymer or lactide-glycolide-caprolactone copolymer.

39. Use of a solid polymer, which is capable of being converted by hydrolysis into one or more organic acids, as an exogenous filter cake disrupting agent in an underground formation treatment fluid.

40. Use according to claim 39 wherein the polymer is polylactide, lactide-glycolide copolymer, lactide-caprolactone copolymer, glycolide-caprolactone copolymer or lactide-glycolide-caprolactone copolymer.